DOE/OR/01-2664&D3
Focused Feasibility Study for Water Management for the Disposal of CERCLA Waste on the Oak Ridge Reservation, Oak Ridge, Tennessee

Comments

1. **Executive Summary, page ix; Introduction, page 1.** These pages (and others) describe that PRGs were developed in the revised FFS to be consistent with Administrator Wheeler's December 31, 2020, Decision. The FFS cannot be approved because the onsite discharge "preferred alternative" (Alternative 2, which DOE has presented to the public as part of the selected remedy) does not meet the threshold requirements of CERCLA that remedial alternatives be protective and meet ARARs.[1] While DOE may claim that the FFS is consistent with the Wheeler Decision, the authority of the Administrator and DOE to respond to releases under CERCLA Section 104 is to "act, consistent with the national contingency plan" or to "take any other response measure consistent with the national contingency plan . . ."[2] While it is not clear from the text what concentrations DOE is proposing as the PRGs, they appear to be either 25% of the DOE Order 458.1 DCS, or the 10-5 Excess Lifetime Cancer Risk (ELCR), or the screening level radiological discharge limits (the last two values are noted in Table K-11). 25% of the DCS translates to 25 mrem/yr, which EPA has already stated is outside the CERCLA risk range and is, therefore, not protective.[3] The ELCR concentrations that DOE has calculated are also outside the CERCLA risk range and are based on inputs that are inconsistent with recreational use of Bear Creek (see comments below on Appendix K), so in addition to not being protective, it does not meet the state relevant and appropriate requirement in 400-40-03-.03(4)(j) FN (c) that a "10-5 risk level is used for all carcinogenic pollutants." Because the 10-5 risk level is tied to AWQC

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[1] This also applies to alternatives 3 and 4: since we must ensure that the alternatives are protective and meet onsite ARARs, as appropriate, it is not clear how they are calculating CWA discharge PRGs for PWTC and OF200.

[2] "Whenever (A) any hazardous substance is released or there is a substantial threat of such a release into the environment, or (B) there is a release or substantial threat of release into the environment of any pollutant or contaminant which may present an imminent and substantial danger to the public health or welfare, the President is authorized to act, consistent with the [HYPERLINK "https://www.law.cornell.edu/definitions/uscode.php?width=840&height=800&iframe=true&def_id=42-USC-671050504-659168512&term_occur=999&term_src=title:42:chapter:103:subchapter:I:section:9604"], to remove or arrange for the removal of, and provide for remedial action relating to such hazardous substance, pollutant, or contaminant at any time (including its removal from any contaminated natural resource), or take any other response measure consistent with the [HYPERLINK "https://www.law.cornell.edu/definitions/uscode.php?width=840&height=800&iframe=true&def_id=42-USC-671050504-659168512&term_occur=999&term_src=title:42:chapter:103:subchapter:I:section:9604"] which the President deems necessary to protect the public health or welfare or the environment." 42 U.S.C. 9604(a)(1).

[3] *Establishment of Cleanup Levels for CERCLA sites with radioactive contamination,* OSWER No. 9200-4-18, August 22, 1997, Attachment B, p. 2 ("EPA has explicitly rejected levels above 15 mrem/yr EDE as being not sufficiently protective.") See also *Distribution of the "Radiation Risk Assessment Q&A"*, OSWER No. 9285.6-20, June 13, 2014. ("The new recommendation of 12 mrem/yr regarding what dose-based ARARs are protective is based on using an updated risk assessment to achieve the same 3 x 10-4 cancer risk as the previous recommendation using 15 mrem/yr.") See also Letter to L. Joseph Callan, February 20, 1998 (". . . radioactive contamination is not singled out in the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended or in EPA regulations as a privileged pollutant for which EPA should allow exceedances above the carcinogenic risk range (10-4 to 10-6) that was determined generally to be protective for other carcinogenic contaminants.").

and recreational use throughout the stream, the "reasonable maximum exposure" has already been determined to include recreational fishing via Tennessee rulemaking and EPA approval; CERCLA, including its risk assessment process, may not be used to downgrade the surface water use classification or to substitute exposure scenarios inconsistent with recreational fishing use. Therefore, until the FFS establishes PRGs that are protective and meet the included CWA ARARs, the FFS is inconsistent with CERCLA and the NCP and cannot be approved.

2. **Section 1.10, page 15.** The text notes, incorrectly, that "[t]he recommended approach for the proposed EMDF landfill wastewater management will be provided in the Proposed Plan, based upon the evaluation in this FFS." While this text accurately reflects the agreement among the Parties in 2015 that the FFS would be finalized prior to the publishing of the Proposed Plan, DOE pressed for an early Proposed Plan prior to having an approved FFS. EPA expects that once the FFS is approved, a Proposed Plan and Administrative Record will be made available to the public consistent with both this text and 40 CFR 400.430(f)(2) and (3) and an opportunity, not less than 30 days, for submittal of written and oral comments on the Proposed Plan and supporting analysis and information. In addition, EPA expects expeditious preparation of the Explanation of Significant Differences (ESD) for EPA and TDEC review, and once approved, for the ESD to be presented for public comment, as noted on page x of the FFS Executive Summary.[4]

3. **Figure 9, Figure 11 and other figures and text throughout the FFS**. Please note that at the time the D2 FFS was prepared, the then-current but not approved DOE RI/FS was proposing Site 5 as the proposed landfill location. Figure 9 reflects DOE's expectation by noting Site 5 as "Current EMDF." Since Site 7C (not even shown on this figure) has replaced Site 5 as the proposed location, text prominently displayed at the beginning of the FFS (or perhaps by another means) should explain this change. In addition, a new figure (for instance, Figure 9-b) should reflect the current proposed location as Site 7C. The text should also explain how the location of the landfill might impact the PRGs. While it would not likely impact the applicable or relevant and appropriate Clean Water Act water quality standards, the location of the landfill or more particularly, the location of the discharge point into Bear Creek, might impact the discharge limits. Figure 11 is a detailed site plan, but for Site 5. Please include a current site plan for Site 7C. Other figures should be updated/replaced as appropriate.

4. **Section 3.1, page 23**. In the last sentence, DOE added "screening level" to the statement that the primary purpose of the FFS is to ensure that the landfill waste water meets the "screening level" discharge limits. DOE's screening level discharge limits are inconsistent with CERCLA and the NCP, as introduced in comment 1 and described in further detail in

[4] "An Explanation of Significant Differences for the EMWMF record of decision will be prepared to include landfill wastewater management and provided for public review and comment." FFS, page x.

comment below on Appendix K. In addition to calculating AWQCs inconsistent with TDEC Recreation use classification, DOE applied a 64x dilution to the already-unprotective ELCR, which is intentionally not protective of the designated use throughout Bear Creek and does not comply with identified CWA ARARs for meeting effluent limits at the end of the pipe and attainment of AWQC equivalent throughout the stream. Under TDEC water quality standards DOE is not allowed to use a "mixing zone" for radionuclides that are bioaccumulative carcinogens.[5] Until the screening level discharge limits, or any discharge limit proposed herein, are consistent with CERCLA and the NCP, that is, are protective and meet ARARs, this FFS cannot be approved.

5. **Table 6, page 35**. Please remove the discharge limits for managed discharge and for LWTS, as these are not protective or meet ARARs; replace with discharge limits consistent with the CWA ARARs and these comments. See comment 1 and the comments on Appendix K. Please note that under Alternatives 3 and 4, any pre-treatment of radionuclides would need to be protective and consistent with onsite ARARs, prior to sending to either the permitted PWTC or the CERCLA-selected OF-200 treatment facility.

6. **Appendix D – ARARs**. DOE has removed text from the D3 that appears to provide a meaningful context for how the state's water quality standards are identified and operate. Unless DOE believes that the text is incorrect, please restore this and other language to the introductory discussion in D3 FFS Appendix D. Below is one example of such informative and helpful text that was in the D2 but removed from the D3. Please restore this and other deleted text, unless it is inconsistent with the Wheeler Decision.

> Surface water bodies in Tennessee are assigned use classifications by the Tennessee Water Quality Control Board. Those use classifications are not assigned based on surrounding land uses, and may have no relationship to how the surface water is currently being used. Tennessee surface water use classifications are listed in TDEC 0400-40-04. Bear Creek, near the EMWMF and the proposed EMDF, is classified by the state for Fish and Aquatic Life (FAL), Recreation (REC), Irrigation (IRR), and Livestock Watering and Wildlife (LWW) uses. All other named and unnamed surface waters in the Clinch River Basin, with the exception of wet weather conveyances, which have not been specifically treated, are classified for FAL, REC, LWW, and IRR uses per TDEC 0400-40-04-.09. Each of the use classifications has water quality standards set under TDEC 0400-40-03, although only the FAL and REC uses have specific numeric AWQC set for particular compounds. The REC AWQC are human health criteria and the FAL criteria are set for the protection of aquatic life. Although all of these criteria, both numeric and narrative, are all potential ARARs for any effluent discharges to Bear Creek, the specific criteria that would be applied and enforced as final limits at a point source outfall, should the selected remedy include an on-site water treatment facility at the EMWMF/EMDF, would be negotiated and set in the final decision document for this action and could

[5] TDEC 0400-40-03-.05(2) ("Mixing zones shall not apply to the discharge of bioaccumulative pollutants to waters of the state where the risk-based factors in Rule 0400-40-03-.03(4)(l) are exceeded for the pollutant group.")

include any subset of these criteria, as determined by the regulatory authorities. A preliminary subset of key contaminants of concern in the leachate/contact water has been identified and agreed to by the Federal Facility Agreement (FFA) parties; this subset has been used during the development and screening of remedial alternatives under this FFS. AWQC for this subset of contaminants of concern are listed in Table D.2. Other narrative water quality standards are included in Table D.1 as potential chemical-specific ARARs .

Per TDEC 0400-40-05-.10(4), effluent discharges are required to meet the anti-degradation requirements of TDEC 0400-40-03-.06 to ensure that new or increased discharges do not cause measurable degradation of any parameter that is "unavailable." Unavailable parameters exist where water quality is at, or fails to meet, the levels specified as water quality criteria in TDEC 0400-40-03-.03.

7. **Appendix D, Table D-1, pages D-5 through D-7.** The table does not identify the state narrative water quality criteria as relevant and appropriate to radionuclides. Please add the following notation to the "Prerequisite" column, for all the narrative water quality criteria: "Release of wastewater or effluents into surface water – **relevant and appropriate** as instream criteria for radionuclides." As with pollutants, this notation can be added in the first row only (but applies to all the similar citations below). In addition, please add the following note for the applicable requirement, "NOTE: under TDEC 0400-40-03-.05 INTERPRETATION OF CRITERIA, mixing zones shall not apply to the discharge of bioaccumulative pollutants to waters of the state where the risk-based factors in Rule 0400-40-03-.03(4)(l) are exceeded for the pollutant group."

8. **Appendix D, Table D-1, page 32.** DOE has removed the citation to TDEC 0400-40-05-.09(1)(b) that was in the D2 FFS, which provides in subparagraph (2) that "For industrial discharges without applicable federal effluent guidelines, best professional judgment should be employed to determine appropriate effluent limitations and standards." Please restore to the ARARs table, as applicable to pollutants and relevant and appropriate to radionuclides, consistent with the pattern in the ARARs table.

9. **Appendix D, Table D-1, pages D-32 and -33.** Please restore the 40 CFR Part 445 requirements as applicable, consistent with the additional ARARs transmitted by EPA to DOE on January 19, 2021; remove footnote 4. The D2 FFS made the same claims that DOE is now making in the D3. EPA disputed the D2 FFS on this and other bases, and this part of the dispute has now been resolved. As agreed in the December 7, 2017, dispute resolution agreement signed by the agencies' Senior Executive Committee, this matter was to be resolved in the FFS dispute. **While we will also address this in the ROD, I do not recommend "being silent" about it in the review of the D3 FFS.**

10. **Appendix K, page K-7**. The text quotes from the Administrator's Decision that "the individual with the potential for reasonable maximum exposure to radionuclides in effluent from ORR landfills would be a recreational fisherman who fishes at a location downstream

from the discharge." While CERCLA may evaluate reasonable maximum exposure in the absence of ARARs or to determine whether an ARAR is sufficiently protective (generally due to multiple contaminants or multiple pathways of exposure) and then to provide a more stringent preliminary remedial goal (or even final cleanup number), the CERCLA risk assessment process may not be used to downgrade or go to a less stringent PRG or cleanup number than one established in complying with an ARAR. In this case, because there are no existing water quality criterion (as a PRG) for radionuclides, the ARAR at 40 CFR 122.44(d)(1)(vi)(A) directs the establishment of effluent limits using a calculated numeric water quality criterion that attains the use classification(s). None of this requirement suggests that the calculated numeric water quality criterion would be different for different parts of the stream, or that the stream's number of fishermen is an attribute to downgrade the designated use. While it may be factually accurate that the downstream location is more likely to fished, that is irrelevant to the calculation of a numeric water quality criterion (unless the calculated criterion is determined to be unprotective for the reasons given above).

11. **Appendix K, Section K.3.2, pages K-14 and following pages**. This section multiplies the mistakes made in the D2 FFS with respect ot derivation of AWQC equivalents and effluent limits for radionuclides. While the D2 FFS was totally based on risk, as established in the RA Position and confirmed by the Wheeler Decision, the Clean Water Act (CWA) and TDEC water quality-based regulations are relevant and appropriate requirements for the discharge of CERCLA waste water into surface water. The risk-based discussion of the D2 FFS should have, therefore, been revised to reflect an ARAR-based approach. All parts of Appendix K that rely on exposure assumptions derived under a use of CERCLA risk assessment to go to less stringent criteria than would be developed under the Clean Water Act (rather than a more stringent one as explained above) must be revised. While the Decision stated that the exposure defaults under the Clean Water Act should not be used, this left DOE with three other options in the Clean Water Act *Methodology* as discussed in the following comment. What is not available is to go to a less stringent exposure than is assumed in the CWA defaults, unless DOE has conducted a scientifically-valid fish consumption survey consistent with CWA guidance that is approved by TDEC/EPA to adjust ingestion rates.

While the D2 evaluated the risk from incidental ingestion/dermal exposure because it was a strictly risk-based evaluation, under the CWA ARAR approach, these exposure pathways are not considered in calculating a water quality criterion protective for fish consumption, and the discussion of water ingestion/dermal exposure should be deleted.[6] Alternatively, it could be kept, so long as it is clear that it is being done in addition to consideration of fish

[6] See TDEC 0400-40-03-.03(4)(j) FN 1 ("These criteria are for protection of public health due to consumption of water and organisms and should only be applied to these waters designated for both recreation and domestic water supply.")

consumption to ensure that the ARAR-derived criterion is sufficiently protective of the designated use.

12. **Appendix K, Fish ingestion pathway, page K-18 and following.** Some of this text (e.g., "These factors are reasonable due to the fact that other nearby water bodies are much larger and thus more supportive of a viable fishery than Bear Creek. Therefore, it is plausible that fish caught at alternate locations may be consumed.") may be relevant in a strictly risk-assessment-based evaluation. As noted in other comments, however, because the CWA is an ARAR and is being used to derive water quality criterion (and from those criterion, discharge limits), the discussion about other fisheries being more viable is irrelevant to the calculation of water quality criterion for Bear Creek that is designated by TDEC for Recreation use. The Clean Water Act (as implemented in EPA approved state Use Classification regulations as part of it Water Quality Standards) does not create less stringent criterion for a lesser-fished stream, especially for reasons of land ownership, access, or potential for diminished fishing due to fish advisories or perceived or real contamination. All surface waters designated in TN for Recreation use are required to meet both narrative and numeric water quality criteria that ensures the streams are fishable/swimmable throughout all reaches of the waterbody.

    In addition, the discussion of "intermittent" streams is misplaced in a CWA-based regime. The TN rule does not identify intermittent streams. Under TN law, all surface waters are streams unless there has been a determination by the state that it is a wet weather conveyance.[7] Please remove this text or clarify that the discussion is for CERCLA risk comparison purposes only (see above discussion). Tributaries of Bear Creek are considered surface waters and include the same TDEC use classifications as Bear Creek per TDEC regulations.

13. **Appendix K, page K-20**. The text describes a calculation that is inconsistent with a methodology for calculating an instream or ambient water quality criteria. These calculations and considerations are inconsistent with the remedy's being both protective and complying with ARARs (See comment 1.) The FFS text states "For the purpose of developing screening level radiological discharge limits, the recreational fisher is located at the stream stretch BCK 3.3–4.5, the closest location to the EMWMF and proposed EMDF where public access is considered more likely." As noted in EPA's CWA guidance for calculating a recreational AWQC, AWQCs are intended to protect the designated use. Bear Creek was designated by the state of Tennessee as recreational (and other uses). As noted in the *Methodology*, "Ambient water quality criteria associated with specific stream uses when adopted as State or Tribal water quality standards under Section 303 define the maximum levels of a pollutant necessary to protect designated uses in ambient waters." There are no "alternate" maximums that downgrade recreational use to allow for

[7] TDEC 0400-40-03-.04(31).

downstream compliance where more fishing is likely and upstream noncompliance where fishing is less likely. If a stream is a designated recreational use stream, it must (under the CWA regulations) meet the criteria throughout, not just at a facility boundary as is allowed under Nuclear Regulatory Commission rules or Department of Energy guidance.

In addition, the Methodology advises that in calculating these recreational use criteria are there are four basic recommendations, none of which are consistent with the FFS text; "The four preference hierarchy is: (1) use of local data; (2) use of data reflecting similar geography/population groups; (3) use of data from national surveys; and (4) use of EPA's default intake rates."[8] Further details about these four preferences is contained in the *Methodology*. In addition, if DOE is going to generate local fish consumption data, it should follow EPA's guidance for conducting a scientifically-valid fish consumption survey.[9] Any plan for a fish consumption survey should be presented in a primary document workplan for regulator review and approval, prior to its implementation.

This text of the FFS goes on to state, "This stretch is located close to where Bear Creek Road intersects with State Route 95. The screening level radiological discharge limits represent the concentrations that can be discharged at the EMWMF V-weir to result in no greater than the water concentrations at this point of exposure. A dilution factor of 64 was used based on the median flow comparison between EMWMF V-Weir discharges and Bear Creek flow at BCK 4.5. Table K.11 provides the screening level risk-based discharge limits based on the concentration that can be discharged at the EMWMF V-Weir that will meet the concentration limits at BCK 3.3–4.5." As noted in the discussion above, none of this is consistent with the Clean Water Act *Methodology* for developing recreational use water criteria, which must be met throughout the stream, not at some distal and/or distant location. In addition, as noted above, under TDEC regulations DOE is not allowed to use a "mixing zone' for bioaccumulative carcinogens much less use approximately 5 miles of the water body to dilute wastewater discharges containing effluent concentrations that are outside CERCLA's generally acceptable risk range for carcinogens.

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[8] *Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health (2000)*, EPA-822-B-00-004, October 2000, p. 4-25.

[9] *Guidance for Conducting Fish Consumption Surveys*, 823B16002, December 2016.